



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,888	05/27/2005	Andreas Schmitz	231121	8548
1678 7590 10/16/2008 MARSHALL & MELHORN, LLC FOUR SEAGATE - EIGHTH FLOOR TOLEDO, OH 43604				
EXAMINER				
CANTELMO, GREGG				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
10/16/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/510,888

Applicant(s)

SCHMITZ ET AL.

Examiner

Gregg Cantelmo

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date 10/8/04
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Preliminary Amendment

1. The preliminary amendment received October 8, 2004 has been received and entered.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Information Disclosure Statement

3. The information disclosure statement filed October 8, 2004 has been placed in the application file and the information referred to therein has been considered as to the merits.
4. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "1" has been used to designate both the current

collector (see page 10, line 5) and electrodes (see page 10, about line 8).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to because the distinction between the gas diffusion layer and the raised portion 13 is not clearly distinguished in Fig. 4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must

Art Unit: 1795

be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the segmented polymer electrolyte membrane design of claim 15 and the plastic fabric with metallic segments of claim 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

Art Unit: 1795

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

8. The disclosure is objected to because of the following informalities:
 - a. The brackets surrounding the term "[printed] circuit" should be amended to --printed circuit--;
 - b. The specification is void of the appropriate section headings. See below.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).

Art Unit: 1795

- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Appropriate correction is required.

Claim Objections

- 2. Claims 19-22 objected to because of the following informalities:
 - a. Claim 19 recites the phrase "(sputtering, vapour deposition)" these species are not mutually exclusive since sputtering is recognized as a form of physical vapor deposition and this is a species of vapour deposition. It may be that the claimed vapour deposition is meant to define chemical vapor deposition as an alternative to sputtering (physical vapor deposition);
 - b. Claim 19 is replete with grammar issues and employs atypical Markush language. For example the attempt to recite a Markush group in lines 6-7 of the claim should be replaced with language such as "selected from the group consisting of copper, nickel, gold, titanium, stainless steel or alloys thereof".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1795

3. Claims 5, 11, 12, 14, 15 and 19-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 is dependent upon itself which is improper and therefore indefinite.

Claim 11 is indefinite. Claim 11 recites "the [printed] circuit board" but fails to indicate which circuit board claim 11 is referring to from the plurality of circuit boards recited in base claim 1.

Claim 12 is indefinite. Claim 12 recites what appears to be an additional current collector. Note that claim 1 already recites current collector features therein. It is unclear whether the claimed current collector of claim 12 is the same current collectors of claim 1 or not. For purposes of claim interpretation, they have been held to be one and the same. However clarification is respectfully requested.

Claim 14 recites the limitation "the outer contacts" in 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 is indefinite. Claim 15 recites that the connecting lugs ... are arranged "on these" however it is not particularly clear what claimed feature(s) the phrase "on these" is clearly meant to encompass. For purposes of claim interpretation the phrase "on these" has been held to be the circuit boards. Applicant is advised to replace the phrase "on these" with the feature(s) this phrase is meant to define.

Claim 19 recites that the steps recited in the body of the claim is directed to the upper side of each printed circuit board. However the body of the claims is inconsistent with a method that would be directed to the upper side of each printed circuit board. It is unclear as to the number of reaction regions in each board. Currently the claim recites a reaction layer but then recites plural diffusion layers in combination with a single MEA. Essentially the body of the claim materially contradicts the preamble given the fact that the preamble recites that the steps of the body pertain to each circuit board, yet the manufacturing steps in the body suggest deposition of plural diffusion layers for each board in association with a single MEA for each board. The combination would then suggest that each board has multiple diffusion layers and distribution structures for a given circuit board for a single fuel cell and further that each board has it's own MEA deposited thereon (thus each fuel cell has plural MEAs). Lastly while the preamble recites that the steps in the body of the claim are directed to each circuit board, the last portion of claim 19 recites features of the combination of both circuit boards having selective structures thereon. Thus the exact method of claim is indefinite. Due to the significant indefinite nature of claim 19, no prior art rejection may be applied until the exact scope of the claimed method is presented in the claims. In addition, claim 19 recites the limitation "the layer" in line 9. There is insufficient antecedent basis for this limitation in the claim.

4. Claim 20 recites the limitation "the whole surface" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. Claim 20 is further indefinite for similar reasons detailed above to claim 19. As discussed above, the

Art Unit: 1795

body of the claims is directed to a method applied to each circuit board and thus appears to recite MEAs formed on each circuit board (thus defining fuel cells having 2 MEAs). This is likely not the case, however due to the ambiguous nature of the claim, the exact scope of the claimed process is not clear. Claim 20 then recites that the MEA is deposited onto the circuit board. Again according to claim 19, an MEA is deposited onto each circuit board (which itself is indefinite) alternatively it is unclear which board the MEA of claims 19 and 20 are actually applied to since it does not seem likely that an MEA is deposited onto each board as recited in claim 19. Thus claim 20 is also indefinite.

5. Claim 22 recites the limitation "the reaction spaces" in lines 3 and 4. There is insufficient antecedent basis for this limitation in the claim. Claim 19 recites a single "reaction region" (singular) which is not commensurate in scope with plural "reaction spaces" as recited in claim 22. Applicant is invited to clarify the number of reaction regions/spaces and also to employ consistent terminology when referring to claimed limitations (for clear and proper antecedent basis).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 1795

6. Claims 1-4, 8-12 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2004/0142227 (Sugai).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

A planar fuel cell system in Fig. 10 comprising at least two fuel cells which are electrically connected in series in a plane via horizontally overlapping connecting lugs 84 and 85 and in each case on the anode side and on the cathode side comprise current collectors (thin layer disposed between the electrode layers 15 and 14 and their respective lids) which are electrically connected to the connecting lugs 84 and 85, and a polymer electrolyte membrane 13 wherein the current path is led around the polymer electrolyte membrane 13, characterized in that wherein the fuel cell system is designed with a printed circuit board technique and as a composite of a first, printed circuit board 77a and a second, printed circuit board 76a, and the current collectors and connecting lugs are designed as strip conductors of these circuit boards (Fig. 10 as applied to claims 1 and 18).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

The connecting lugs 84 and 85 are located within the edge boundary of the circuit board composite (Fig. 10 as applied to claim 2).

Perpendicular contacting strips are formed between the overlapping portion of lugs 84 and 85 as shown in Fig. 10 (applied to claim 3). These strips are a conductive material formed in a hole (e.g. opening or bore) in the casing 102 (Fig. 10 as applied to claim 4).

Gas distribution structures are provided on both sides of the boards (Fig. 10 as applied to claims 8-10).

The lower portion 76a includes a raised portion which defines the active fuel cell area and reaction region (Fig. 10 as applied to claim 11).

Art Unit: 1795

The reaction region contains gas distribution structures (in the electrode layers), current collectors (disposed between the electrodes and the fuel cell casing) which are both flat (Fig. 10 as applied to claim 12).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of

Art Unit: 1795

35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugai as applied to claim 4 above, and further in view of U.S. Patent No. 6,399,232 (Eshraghi).

As best that claim 5 can be understood, pending clarification regarding the dependency of claim 5, the claim has been interpreted to be dependent upon claim 4 (based on the recitation and proper antecedent basis for the phrase "the electrically conductive material" recited in claim 5 and found in claim 4).

Sugai does not teach of the electrically conductive material connecting the lugs being a solder or electrically conductive adhesive.

The concept of interconnecting current collectors using an electrically conductive solder or adhesive is well known in the art as taught by Eshraghi (see prior art claims 2 and 31) .

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugai by selecting the electrically conductive interconnect between serially connected current collectors to be a material such as an electrically conductive solder or adhesive since such materials were recognized in the art for such purposes as taught by Eshraghi.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugai as applied to claim 4 above, and further in view of U.S. Patent Application publication No. 2004/0224190 (Sasahara).

Art Unit: 1795

Sugai does not teach of the bore being metallized on its inner side.

The concept of providing a metallic coating on the sidewalls of vias in a fuel cell system has been recognized in the art as shown by Sasahara (paras. 87 and 114) .

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugai by coating the vias of the boards with a conductive metallic layer as taught by either Sasahara or since it would have improved the conductive path between the lugs of adjacent cells.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugai as applied to claim 3 above, and further in view of either U.S. Patent No. 6,541,147 (McLean) or U.S. Patent Application publication No. 2004/0175606 (Komura)

Sugai does not teach of using rivets as the contacting element.

The concept of providing using rivets to connect various elements in fuel cell system has been recognized in the art as shown by McLean (para. bridging columns 7 and 8) or Komura (Fig. 16, reference character 136 and para. 106).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugai by using rivets to connect various elements in fuel cell system as recognized by either McLean or Komura since it would provided a suitable means for fastening and connecting various components of the planar fuel cell array.

Art Unit: 1795

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugai as applied to claim 1 above, and further in view of either U.S. Patent No. 4,867,857 (von Benda), U.S. Patent No. 7,323,266 (Morishima) or U.S. Patent No. 5,863,671 (Spear)

As best that claim 13 can be understood, Sugai does not teach of the diffusion layer being a plastic fabric provided with metallic segments.

von Benda teaches that such materials are known in the art as gas diffusion layers in an electrochemical system (col.. 3, ll. 33-52) as does Morishima (Fig. 4 and embodiment 1) and Spear (col. 4, ll. 22-40).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugai by designing the gas diffusion layer to be a plastic material with metallized segments since it would have provided a lightweight, conductive diffusion media.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugai as applied to claim 1 above, and further in view of either U.S. Patent Application Publication No. 2004/0115498 (McDonald), U.S. Patent Application Publication No. 2003/0044672 (Fukumoto), U.S. Patent No. 5,989,741 (Bloomfield)

Sugai does not teach of a segmented MEA.

Each of McDonald (para. 49), Fukumoto (Fig. 2) and Bloomfield (Fig. 1) teach of the concept of forming a plurality of discrete fuel cells on a common electrolyte membrane, thereby forming a segmented MEA array provides a cost-

Art Unit: 1795

effective and efficient method for fabricating an array of fuel cells in a planar fuel cell array.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugai by using a segmented MEA as taught by either McDonald, Fukumoto or Bloomfield since it would have provided a cost-effective and efficient method for fabricating an array of fuel cells in a planar fuel cell array.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugai as applied to claim 1 above, and further in view of U.S. Patent No. 5,863,672 (Ledjeff) or U.S. Patent No. 6,127,058 (Pratt).

Lugs 84 and 85 are arranged to overlap into the reaction region portion of the fuel cell and are permanently connected to the board (see Fig. 10).

Sugai does not teach of a weld connection between the lugs and the substrate board.

It is well known in the art to weld the various elements in a planar fuel cell array as shown by Ledjeff and Pratt (col. 5, ll. 7-12).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Sugai by welding fuel cell elements together including welding the components of the fuel cell system since it would have provided a sufficiently strong bond between the various components thereby improving the physical and electrical contact and conductivity of the fuel cell array.

Conclusion

Art Unit: 1795

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Cantelmo/
Primary Examiner, Art Unit 1795